Information Technology:
Offering Solutions to Data Management

by Eckhart Beatty

In 2004, President George W. Bush signed an executive order authorizing development of a nationwide health-information-technology (HIT) infrastructure. With the goal of improving the quality and efficiency of health care, the interoperable system will help ensure timely diagnoses, reduce medical errors and improve the coordination of care and information among hospitals. The National Alliance for Health Information Technology, a collaboration of health-care and government leaders, was organized in 2005 to help the nationwide advancement of HIT.

Information-management systems are raising the bar on high-quality health care.

Located in San Francisco, the Health Technology Center (HealthTech) researches the impact of emerging technologies on health-care delivery. Forty-six member organizations fund the nonprofit center to conduct health-information research on a national and global level. HealthTech is recognized for its unbiased, comprehensive research.

CEO and founder Molly Coye, MD, MPH, says: "We built HealthTech working closely with Sutter, Kaiser, CHW, John Muir, El Camino, Stanford and Chinese Hospital — all of the key health systems in the Bay Area. Together, we're employing technology to advance safety, quality and the efficiency of health care."

HealthTech recently served as the launching pad for a new statewide organization, CalRHIO, which will link medical records between hospitals, doctors' offices, nursing homes and patients. "Five years from now, health care in California will be vastly improved because of the applications of HIT being pioneered today in Northern California," says Coye.

IMPROVING PATIENT-PHYSICIAN COMMUNICATION

The challenge lies in effectively communicating and managing the growing mass of information between patients and doctors. "We all know how hard it

is to reach our doctors by phone," explains David Joyner, senior vice president of network management at Blue Shield of California, based in San Francisco.

Blue Shield has been collaborating with RelayHealth, which is located in Emeryville and provides online health-care communication services, in refining a messaging system for efficient communication among patients, health-care professionals, payors and pharmacies. Based on a pilot project, the program is progressing well. "We have been very pleased with the results," Joyner emphasizes. "Use of the Internet in health care is becoming critically important in most of our lives, and it represents an especially exciting new direction for us in the health-care sector. It makes sense."

Blue Shield uses San Jose-based Resolution Health for data collection. Based on the results of database analyses, patients taking combinations of different medications can be quickly notified of any "contraindications" or adverse reactions. With the automated system, health-care providers may contact patients about any concerns well before a prescription is filled. Resolution Health's electronic data systems are enabling higher-quality health care.

Another example of HIT innovation is at the Palo Alto Medical Foundation (PAMF), a multi-specialty group practice that implemented an electronic-health-record system six years ago. PAMF, based near Stanford University, is an affiliate of Sutter Health, with headquarters in Sacramento.

Paul Tang, MD, PAMF's chief medical information officer, explains, "In an information-intensive industry such as health care, effective use of information technology is a pre-requisite to delivering safe, high-quality care." At the click of a button, complete patient data is available to any authorized health-care professional from any computer.

PAMF's electronic-health-record (EHR) system was first installed for primary care, and is now available for medical specialties throughout the PAMF system.

With its new HIT system in place, physicians and other specialists simply enter information into the appropriate field of a computer. Though dictation of information is permitted, handwritten reporting is no longer acceptable. This means the long-standing line about "illegible doctor's writing" and accompanying potential errors in reading prescriptions will soon become a distant memory.

Since access to and entry of relevant information is role-based, security at all levels is greater than it has ever been. For example, a clerk might not be able to view certain information doctors can readily access. "You now have a level of accountability you never had before," Tang insists.

Tang explains that the implementation of its electronic-health-record system produces a number of beneficial by-products. Tang points to enhanced rates of immunization and reduced levels of drug interactions. Converting to electronic records has also saved more than $2 million in costs associated with maintaining paper records. The bottom line is that, thanks to information-management systems, higher-quality health care is becoming reality.

HIGHEST QUALITY CARE WORTH THE EXTRA COST

In addition to the electronic-health-record system, PAMF offers a patient portal, PAMFOnline, which securely connects its patients with their electronic records via the Internet. Patients may also communicate with their physicians using PAMFOnline. Currently, more than 40,000 patients have enrolled in PAMFOnline, and more sign up every week. The figures speak for themselves. Health-care organizations are feeling increasing pressure to offer online services, making it easier to provide timely answers to health-related questions.

In 2004, Sutter Health committed $154 million to a two-year electronic health-records project. One of California's more comprehensive systems, Sutter's

inpatient-outpatient system will ensure timely access to patient data by connecting more than 5,000 physicians with millions of patients among its 27 hospitals.

Despite the high costs associated with the system, its popularity is increasing. Tang believes that "implementing an EHR system across the entire Sutter enterprise is the most effective way to enhance patient safety and coordinate care across the health-care continuum." During the next decade, $1.2 billion has been earmarked for a comprehensive package of safety initiatives throughout Sutter Health's facilities. Among soon-anticipated innovations is bar-coding technology for safer bedside-administration of medications.

KAISER PERMANENTE AT THE INFORMATICS VANGUARD

The Permanente Medical Group, based in the Greater Bay Area and by far the largest medical group in the nation, cares for 3.2 million members in Northern California alone. Its parent, Kaiser Permanente, is the nation's largest health maintenance organization (HMO). With headquarters in Oakland, the 5,000 Kaiser Permanente physicians use advanced information technology (IT) systems and the Internet to treat 500,000 chronically ill patients. Kaiser Permanente has demonstrated the potential value of IT networks perhaps better than any other organization.

According to Robert Pearl, MD, Kaiser executive director and CEO, the group began developing its Clinical Information Practice System (CIPS) a decade ago. By combining an integrated delivery system with a sophisticated IT system, Kaiser Permanente has been able to lower the mortality of its members 30 percent below the rate of patients cared for in the communities around them. This would not have been possible without the current applications that link Kaiser Permanente's offices, laboratories, radiology departments, pharmacies and emergency rooms. Kaiser Permanente physicians also use another Internet-based system called "e-Rx," which is an online physician ordering system that is now used for more than 70 percent of prescriptions.

Practitioners are enthusiastic. "Our physicians love the technology," Pearl emphasizes. Evidence is found in its hiring data. Today, Permanente Medical Group receives eight applications for each opening and since 2002, has hired 2,343 doctors — 530 of them in 2004 alone. Pearl says that Kaiser Permanente hires more than 50 percent of the medical residents emerging from Northern California's top medical schools — University of California, San Francisco (UCSF), Stanford University and the University of California, Davis.

Kaiser Permanente is currently implementing a new $3 billion IT system called KP HealthConnect. It will expand the current system and include not just the medical offices and emergency departments, but all of the inpatient hospital operations. "No one in the nation has this level of integration and data," Pearl says.

ELECTRONIC INITIATIVES IN RESEARCH AND TEACHING ENVIRONMENTS

UCSF is one of the world's leading medical and teaching institutions. Ronald D. Miller, MD, professor and chair of UCSF's department of anesthesia and perioperative care, believes UCSF will be the first such institution in the country to deploy a 100 percent integrated, perioperative management and clinical system.

Miller was initially attracted to the program because of the system's ability to automatically record anesthetic information. "This means that all of the data on a patient's vital signs, as well as every drug that has been administered and any other important events, are automatically recorded into the computerized system," Miller explains. The system will be available in 32 operating rooms and other sites where anesthesia is given at UCSF Parnassus, as well as Mount Zion.

Preoperative evaluation, materials management, nursing personnel, operating room schedules, intraoperative data and the post-anesthesia recovery room are all automatically recorded in a uniform electronic format. Through computerized reporting, information from clinical labs, pharmacy and anesthesia databases are integrated, thereby further promoting patient safety and best practices. The system's chief advantages include the accuracy of "timing data," as compared to handwritten records. The database of collected information enables medical centers nationally to work together using a common dictionary.

UCSF is simultaneously installing information systems for operating room management, as well as clinical information components of complete perioperative services. This allows care both immediately before and after medical procedures. UCSF spent the past couple of years implementing the system, which is expected to be fully operational by 2006.

Acknowledging the considerable expense of such systems, Miller is confident that electronic medical records will continue to be built in the future, regardless of costs. He alludes to growing pressure from the Institute of Medicine, the American Society of Anesthesiologists and other such well-regarded organizations working on the federal level to use automated medical records.

PRICELESS TECHNOLOGY

The apparent consensus throughout the Bay Area medical community is that HIT systems are raising the bar on high-quality health care, and they are proving themselves to be priceless to patients.